WEST

End of Result Set

☐ Generate Collection

L5: Entry 2 of 2 File: USPT Aug 11, 1998

DOCUMENT-IDENTIFIER: US 5793733 A
TITLE: Polarizing beam splitter and method for manufacturing same

ABPL:
A polarizing beam-splitter comprises an optically isotropics crystalline substrate and a birefringent material layer made of an oriented polydiacetylene film formed on the optically isotropic crystalline substrate. A periodic grating photo-mask is formed in the birefringent material layer by an area that is changed into a different color phase when an ultra violet light is irradiated in a predetermined pattern on the birefringent material layer and by an area in which the color remains unchanged. The periodic grating photo-mask has a diffraction efficiency for the orientation of the oriented polydiacetylene film in the area that is changed into a different color phase which is lower than that in the area in which the color is unchanged.

BSPR:
In accordance with the invention, a polarizing beam-splitter comprises an optically isotropics crystalline substrate and a birefringent material layer made of an oriented polydiacetylene film formed on the optically isotropic crystalline substrate. A periodic grating photo-mask is formed in the birefringent material layer by an area that is changed into a different color phase when an ultra violet light is irradiated in a predetermined pattern on the birefringent material layer and by an area in which the color remains unchanged. The periodic grating photo-mask has a diffraction efficiency for the orientation of the oriented polydiacetylene film in the area that is changed into a different color phase which is lower than that in the area in which the color is unchanged.

DEPR:
The polarizing beam-splitter 10 constructed in the above mentioned manner shows the properties described below. As illustrated in FIG. 1(b), the thickness of an optical glass substrate 11 is "t"; the thickness of the birefringent material layer 12 (oriented PDA film 12a) is "d"; the diffraction efficiency of the optical substrate is "ns"; the diffraction efficiency of the area 121, in the oriented PDA film 12a, whose color-phase is changed is "nc"; the diffraction efficiency for the area 122, in the oriented PDA film 12a, whose color-phase is unchanged under an ordinary light is "no"; the diffraction efficiency for the area 122 whose color-phase is unchanged under an extraordinary light is "ne" when the wave length of the beam emitted from a semiconductor laser is .lambda. and k=2.pi./.lambda.. In the following descriptions, a normal light is defined as a polarized light vibrating orthogonal to the orientation "H" marked with an arrow "I"; an extraordinary light is defined as a polarized light vibrating along the orientation "H".